

STEM Sims

Lesson 4: Light Emitting Diode (LED) Light bulbs

In Light Emitting Diodes, electron movement is converted directly to light, with very little of the energy being converted into heat. Because of this, they have the lowest operating temperature of the major types of light bulbs. LED's have many advantages over incandescent and fluorescent lights. Since there is no filament, there is no way for them to burn out. Additionally, they are much more energy efficient; incandescent bulbs typically produce 17 lumens per Watt of electricity, CFL's produce 50-70 lumens per Watt, and LED's produce around 112 lumens per Watt.

Doing the Science

- Start the Bright Ideas Simulation by clicking on the "Sim" tab. 1.
- 2. Click on the LED light bulb. It will move to the base. Record the number of watts that the display reads on the base in Table 1 below.
- Click on the timer in the lower right hand part of the screen. When the bulb burns out, the data 3. will be filled in below. Repeat step 2 over and over again until your time is out. A table will appear with all of the data for the LED row completed.
- 4. Record your findings in Table 1 below.

Table	1.

Bulb Type	Bulb Wattage (W)	Average bulb life (hours)	Cost of light bulbs	Electricity cost	Total cost
LED					

Do You Understand?

1. Looking back at the data you collected from Lesson 3, which bulb has the higher total cost? higher electricity cost?

2. If all other variables remain the same, how much would each LED bulb have to cost to make it the most cost and energy efficient option?